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MOTOR TRUCKS ON EASTERN FARMS

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THE MOTOR TRUCK is a valuable addition to the equipment on many farms. Farmers often lack sufficient information, however, concerning the use of a truck for farm work and the cost of operating it to enable them to decide whether one will be profitable or what size and type will be best.

This bulletin, based on the experience of 753 farmers in the Eastern States who use motor trucks on their farms, is not intended to influence either for or against the use of a truck, but is designed to give other farmers in that section of the country information which will assist in making an intelligent decision.

A complete analysis of the reports which form the basis of this bulletin is contained in Department Bulletin 910, "Experience of Eastern Farmers with Motor Trucks."

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EASTERN FARMERS WHO OWN MOTOR TRUCKS.

THE experience of farmers who already own and use motor trucks is especially valuable to one who is considering the addition of one of these machines to his farm equipment. In order to provide information of this kind for farmers in the New England and Middle Atlantic States, a large number of farmers who were known to own trucks were asked for reports concerning their machines. Each report gave the type and size of the truck, the use made of it, the cost of operation, its advantages and disadvantages for farm use, the owner's idea of its profitableness, and other related information.

Of the reports which were received all were excluded that had to do with secondhand trucks, trucks made by the addition of truck units or attachments to passenger cars, and all that came from men who had owned their trucks six months or less, or used them primarily for custom work or in connection with other business and only incidentally for farm work. This left answers from 753 men, of whom 241 are located in New York, 235 in Pennsylvania, 92 in New Jersey, 63 in Massachusetts, 40 in Maryland, and lesser numbers in Maine, New Hampshire, Vermont, Rhode Island, Connecticut, and Delaware.

These men operate farms of all sizes and types, varying from truck farms of only a few acres to large crop farms containing several hundred acres.

One hundred and forty-nine of them are operating truck farms. The average size of these truck farms is 64 acres, and the average distance from market is 12 miles.

One hundred and twenty-nine are operating farms, on which dairying is the principal enterprise. The average size of the dairy farms is 234 acres, and the average distance from market is 6 miles.

One hundred and thirteen are operating fruit farms with an average size of 111 acres and an average distance from market of 11 miles.

Forty-eight are operating crop farms on which general field crops are raised, but where few or no dairy cows are kept and no live stock is raised for sale. The average size of these crop farms is 237 acres, and the average distance from market is 8 miles.

Three hundred and fourteen are operating general farms on which no one special enterprise predominates. The average size of these general farms is 210 acres, and the average distance from market is 11 miles.

The fact that more of the reports are from men who operate general farms than from any other class does not indicate that the percentage of such farmers who own motor trucks is larger than that of men who follow special types of farming, but that in this region, there are more general farms than of any other type.

The motor trucks reported on are of many sizes, ranging from one-half to five tons capacity. However, nearly half of the total number are of the 1-ton size, and only about 2 per cent are rated at more than 2 tons.

No attempt was made to determine to what extent income had been increased through the use of the trucks, but 95 per cent of the reports stated that the machines bade fair to be profitable investments. So far as could be determined the size of the truck, the type of farming practiced, and length of time the machine had been owned had little to do with the owner's idea of its profitableness. Some who do not consider that their motor trucks are proving profitable, are men who have found them unreliable, often out of order when needed, or expensive to keep in repair. Others have found that they do not have enough work for the truck to justify investment in such an expensive piece of equipment.

ADVANTAGES AND DISADVANTAGES.

There are many advantages in the ownership of a motor truck, but just how great these advantages are, and which should be given the greatest weight, are questions which the man who has not had experience with a truck can not answer. The important thing for the prospective purchaser of a motor truck to know is what the men who have used trucks have found to be their principal advantages and disadvantages in actual practice. These motor-truck owners were asked the questions, "What have you found to be the principal advantage of a truck for farm work?" and "What is the principal disadvantage?"

The replies to the first question emphasize the following points:

Saving time.—Over 90 per cent believe that saving time is the principal advantage. The saving of time effected by the truck not



FIG. 1.—Hauling apples. The motor truck above makes practically three trips to every one made by the horses and wagon below.

only enables the owner to put in more time at work on the farm, but also often enables him to go to a better market, or to get perishable produce to market in better condition than would be possible with horses and wagon (see fig. 1).

Saving horses.—About 3 per cent believe that saving horses is the principal advantage. Long hauls to market over hard roads are more wearing on most farm horses than is farm work. The use of a truck not only relieves the horses of this hard work, but leaves them available for work on the farm while the truck does the road hauling.

Better markets.—Only 2 per cent consider that the principal advantage of the truck is that it enables them to go to a better market. However, nearly one-fourth of the total number are now selling on better markets than they did before they owned their trucks, and in most cases these new markets are at a considerably greater distance from the farm than were the old markets. Going to a market, which is farther from the farm is now simply a matter of taking more time for marketing, and part of the men who consider that saving time is the principal advantage find that the trucks save them sufficient time to enable them to go to the better market.

Convenience.—About 2 per cent consider that the greater convenience of the motor truck is its greatest advantage.

Reduction of expense.—Only 1 per cent consider the reduction of expense is the principal advantage.

The fact that such a small number consider the saving of horses, reduction of expense, and greater convenience as the principal advantage indicates that the amount of time which motor trucks will save, which incidentally may result in reaching a better market or in getting produce to market in better condition, is the item which should be given paramount importance by the prospective purchaser.

The answers to the question, "What is the principal disadvantage of the truck?" emphasize the following points:

Poor roads.—This was given as the principal disadvantage by 59 per cent of those who answered this question. A large percentage of the reports stated that there is some time during the year when the roads are in such condition that motor trucks can not be used. The men who live on unimproved roads have the greatest handicap in this respect, but even the best roads in this region may be impassable for trucks because of snow at certain times of the year.

Cost of operation.—Seventeen per cent consider operation costs the principal disadvantage. The cost of operating trucks of different sizes varied from an average of 8 cents per mile for the one-half-ton truck to 20 cents per mile for the 2-ton machine.

First cost.—The first cost of these trucks varied from less than \$1,000 to over \$3,000. Five per cent of the owners consider that this is the greatest disadvantage. Few of these farmers sold enough horses to pay for the truck, and in most cases the truck represents an added investment in equipment.

Inability to operate on soft ground.—Nine per cent consider this the greatest disadvantage. A majority of the men reporting use

horses and wagons for hauling in the fields and around the buildings, but most of them do not consider the fact that the truck can not be used satisfactorily for such work as its principal disadvantage.

Incompetent drivers.—Most of the trucks are driven by the owner or some member of his family, but a considerable number of those who hire drivers consider the incompetency of such drivers as the principal disadvantage connected with the use of the truck.

Mechanical troubles.—About 1 man in 35 says that trouble due to mechanical defects in the construction of the machines is the principal drawback to their use.

THE BEST SIZE.

That most of these men consider their motor trucks profitable investments does not mean that each is entirely satisfied with the particular machine owned. It is very important that the truck should be of the proper size for the hauling which it is to do. Ordinarily

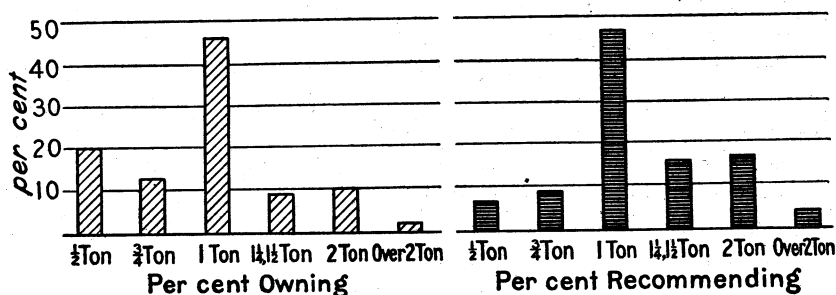


FIG. 2.—Sizes owned and recommended.

both the first cost and the cost of operation of a small truck will be less than the cost of a large one, but often the small truck will not carry loads as large as desired, and more trips to haul a given amount of material will be necessary than with a larger truck. On the other hand, a truck which is too large would have to be operated with only part of a load much of the time, and the extra cost of operation at these times would exceed the saving effected by being able to carry larger loads on exceptional occasions.

The recommendations of the experienced truck owners who answered the question, "What size do you now consider best for your conditions?" are particularly significant. Experience has caused 64 per cent to prefer the same sizes as they now own, 34 per cent to prefer larger sizes, and 2 per cent to prefer smaller sizes.

The proportion of those reporting who now own the different sized trucks and the proportion who, after having had experience, prefer trucks of a certain size are shown in figure 2.

The preferences of these men indicate that in most cases the choice of a truck which is to be used primarily for farm work should lie among the 1-ton, $1\frac{1}{4}$ -ton, $1\frac{1}{2}$ -ton, and 2-ton sizes. Sixty-five per cent now own one of these sizes, and experience has convinced 80 per cent that one or the other of these sizes is best. The specific size for any individual farm will depend, of course, upon the hauling requirements of that farm.

DISTANCE TO MARKET.

The time required for hauling to and from the farm generally is greatest for those farmers farthest from markets, and it is on such farms that most use will be found for motor trucks. The most striking point concerning the eastern farms on which trucks are already owned is their greater distance from market than other farms in the same section. Only 18 per cent of them are less than 5 miles from market, nearly 25 per cent are 20 miles or more, and the average distance from market of all is about 10 miles.

Probably a majority of all farms in the eastern part of the country are less than 5 miles from market, and comparatively few operators of these near-by farms have as yet invested in motor trucks. The man who is only 2 or 3 miles from his market must have an exceptionally large amount of hauling if he expects sufficient work for a truck to make it a profitable investment.

CHANGE OF MARKETS.

Many farmers who do not own trucks are using first-class markets, and there are many whose farms are so located that even motor trucks will not put such markets within reach. However, about one-fourth of these eastern farmers who now own trucks have changed since purchasing trucks to markets farther from the farms, and a large majority of them say that the new market is better than the old one.

The men who have changed markets are on an average 7 miles from the markets they used before purchasing trucks and 20 miles from the markets which they now use. Before purchasing trucks 75 per cent of them were using markets which were less than 10 miles distant, but now over 80 per cent are using markets which are 10 miles or more from their farms. About one-fifth go to markets which are 30 or more miles away.

A somewhat smaller percentage of dairy farmers than of any other type changed their markets. When milk is hauled to a condensary or to a station for shipment it is not often that one market or station is enough better than any other to warrant a change.

The reports do not show the extent to which the use of the better markets has increased the income, but this increase, especially for a truck farmer or a fruit farmer, is sometimes in itself enough to make the motor truck a profitable investment.

ROAD HAULING WITH TRUCKS.

Figure 3 shows the time required for the round trip when hauling different distances with wagons and with trucks as reported by these truck owners. This includes the time required for loading and unloading the wagon or truck. On the average it requires only 35 to 40 per cent as much time to make a haul of a given length with a truck as it does with horses and wagon.

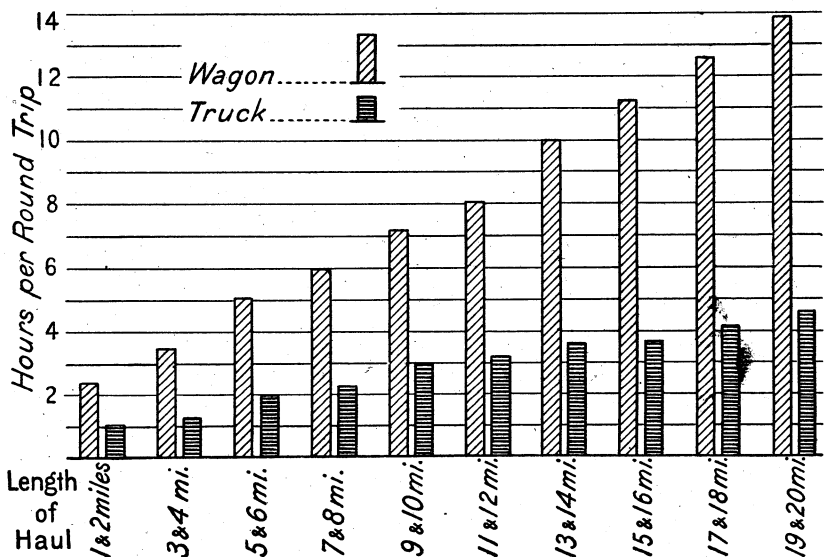


FIG. 3.—Comparison of time required (hours per round trip) for hauling different distances with trucks and with wagons.

This chart will give the prospective purchaser a definite idea of the amount of time a truck will save him, provided he expects to haul the same size loads with the truck as he does with horses and wagons. As a matter of fact, the owners of smaller trucks usually haul smaller loads and the owners of larger trucks haul larger loads with their trucks than they formerly hauled with horses and wagons. Consequently the total amount of time which the larger trucks are saving their owners is greater than that indicated in the chart, and the total amount saved by the smaller trucks is smaller than that indicated.

When hauling crops on the road the average load for the half-ton trucks owned by these men is about 950 pounds, whereas the average load formerly hauled with horses and wagons was 1,500 pounds. The

average load of crops for the three-quarter ton trucks is 1,850 pounds, 15 to 20 per cent less than was formerly hauled with wagons by the same men. The owners of 1-ton and $1\frac{1}{4}$ and $1\frac{1}{2}$ ton trucks haul on the average about the same size loads as formerly with horses and wagons. The average load of crops for the 2-ton trucks is 4,950 pounds, about 10 per cent greater than the load formerly hauled with wagons. The trucks which are larger than the 2-ton size haul loads 30 per cent larger than their owners formerly hauled with wagons.

The average loads of all materials (except milk) are approximately the same as the loads of crops for trucks of different sizes and for wagons. Milk on these farms is hauled almost entirely with either 1-ton or smaller trucks. Only 10 of the trucks on the 129 dairy farms are more than 1 ton in size. The average load of milk for the $\frac{1}{2}$ -ton

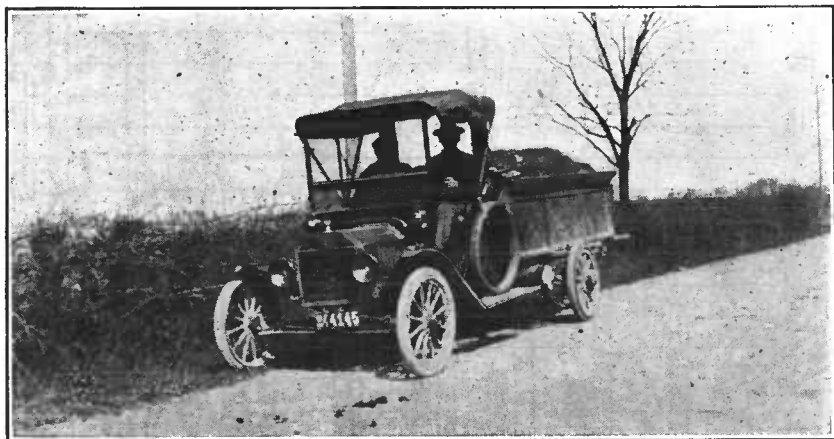


FIG. 4.—A truck farmer hauling a load of manure to the farm on his return trip from market.

trucks is 600 pounds, and for the $\frac{3}{4}$ -ton and 1-ton trucks, 1,300 pounds, and all these men formerly hauled approximately the same size loads with their wagons as they now do with their trucks.

The dairy farmers are also nearer to their markets and shipping points than are the truck owners who practice other types of farming. (See page 4.)

RETURN LOADS.

The percentage of time which a truck is run without a load has a direct influence on the cost per unit of hauling with the truck. If the farmer can arrange to haul a load of produce to market and bring back a load of supplies to the farm on the same trip, he will reduce the time required and expense for hauling practically 50 per cent (see fig. 4). The reports of these men show that they have loads both ways for their trucks on an average of about 26 per cent of their trips. Thirty per cent of the men, however, stated that they never

have return loads. The dairy farmers and general farmers reported return loads a considerably larger percentage of the time than did the fruit, truck, and crop farmers.

ROAD HAULING FOR WHICH TRUCKS ARE NOT USED.

Nearly two-thirds of those owning trucks still used their horses to supplement their trucks in hauling on the road, and 45 per cent of the men who reported that they used their horses for some hauling on the road during the year covered by their reports gave poor roads as the reason—that is, hauling had to be done at times when the condition of the roads was such that their trucks could not be used. A majority of the remainder stated that they used their horses either because the truck was too light for the load which it was desired to haul, or because the body of the truck was unsuited to carrying the material. However, no farmer with a truck larger than the 1-ton size stated that he used horses because the truck was too light. About 7 per cent of the total number said that they used their horses to help out when the truck was busy, and about an equal number said that since they must keep their horses anyway they used them for some road hauling when they were not busy at other work.

It was not possible to determine from the reports the exact proportion of the hauling to and from these farms which is still done with horses. However, on a majority of them horses were used only for road hauling which it was necessary to do at times when the trucks could not be used or for which the trucks were not suitable, and ordinarily such hauling would amount to only a small percentage of the total.

THE EFFECT OF DIFFERENT KINDS OF ROADS ON USE OF TRUCKS.

Poor roads are to most men who own trucks the principal disadvantage connected with their use, and poor roads are why most of them still use horses for part of their road hauling. On the average there were eight weeks in the year covered by the reports when the roads were in such condition on account of mud, snow, etc., that the trucks could not be used. (See fig. 5.)

It does not necessarily follow that horses were always used for hauling when the roads were in such a condition that the trucks could not be used, as on a part of these farms there was no hauling which it was necessary to do at such times.

Twenty-nine per cent of these trucks travel usually on dirt roads only, 46 per cent on roads that are part dirt and part improved, and 25 per cent on roads which are wholly improved. On the average there were 10.7 weeks during the year when the trucks which travel

only on dirt roads could not be used, 7.8 weeks when those which travel partly on dirt roads and partly on improved roads could not be used, 3.5 weeks when those which travel solely on improved roads could not be used.

In all, less than 25 per cent of the men found it possible to use their trucks every week in the year, and between 35 and 40 per cent reported that there were more than eight weeks during the year when they could not use their trucks. About one-half of the men with wholly improved roads stated that they could use their trucks any time during the year, but only 9 per cent of those with all dirt roads were able to do so, and there were more than eight weeks during the year when 55 per cent of these men with all dirt roads were unable to



FIG. 5.—A road such as this will probably be impassable for a truck during several weeks of each year.

use their trucks. Snow was doubtless the main factor in making the roads impassable for the men who have improved roads only, but who found that there was at least one week during the year when they were not able to use their trucks.

The kind of tires with which these trucks are equipped apparently has little to do with the time the condition of the roads prevents their use.

HAULING ON THE FARM WITH TRUCKS.

A majority of these truck owners still haul in the fields and around the buildings exclusively with horses. The reason for not using the truck for this hauling was not given in every case, but many stated

that they do not consider their trucks suitable for such work. The smaller trucks in many cases will not carry as large loads as it is desired to haul, often the truck can not obtain traction in the fields, and sometimes the body with which it is equipped is not suited to the material to be hauled.

Many others stated that they use their horses for all hauling on the farm because there is no advantage in using the truck for such work. Most of the time required for hauling on the farm is taken up with loading and unloading and the percentage of the total time which will be saved by the truck when used for such work is small as compared with the time it will save in road hauling. When there

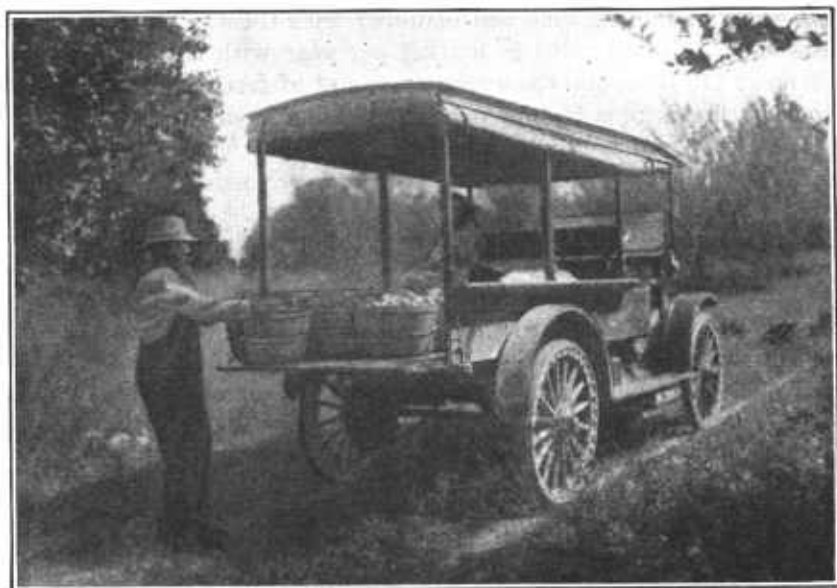


FIG. 6.—The truck can often be used advantageously for hauling fruit from the orchard to the packing house.

are horses on the farm which would otherwise be idle, it would naturally be more profitable to use the horses and let the truck stand idle if there is no advantage in time saved or convenience in using it.

The men who reported that they use their trucks for some hauling on the farm stated that most of such hauling is crops and fertilizer, including lime and manure. The average length of haul reported was about 150 rods. (See fig. 6.)

The saving of time was given by 64 per cent of these men as the reason for using their trucks in preference to horses. A truck will save some time over horses on hauls even of this distance if the truck body is suitable for carrying the material to be hauled and if there is no difficulty in obtaining traction in the fields. It may also save

time to use the truck when only one or two loads are to be hauled and the horses and wagons are not ready for use.

Eighteen per cent reported that they use their trucks for some hauling on the farm because a truck is more convenient than horses and wagon. When frequent stops must be made, or when the vehicle must be left without attention for a considerable length of time, it may be preferable to use the truck even though the horses remain idle and no time is saved by use of the truck.

Eleven per cent used their trucks because all the horses were busy at the time.

The men who do use their trucks for hauling on the farm reported hauling only an average of 45 tons of crops and 37 tons of fertilizer per year (including lime and manure) with them, while the average amount of crops hauled to market per year with trucks for all the farms is 119 tons, and the average amount of fertilizer hauled on the road with trucks is 55 tons per year. Thus, even the comparatively small number of men who use their trucks for hauling on the farm still use their horses for a goodly share of such work.

CUSTOM WORK.

A considerable number of farmers have purchased trucks primarily for doing custom hauling and only incidentally for work on their own farms, but such use of a truck is really an enterprise separate from the operation of the farm, and no reports of men who are using their trucks in this way are included in the 753 which form the basis of this bulletin.

However, the man who purchases a truck simply as an addition to his farm equipment may find it possible and profitable to do some custom hauling for his neighbors. About 28 per cent of the men who reported on this item stated that they did some custom work during the year covered by their reports. The average amount received by the men who did such work was \$174.

About 30 per cent of these men who had done custom work stated that it had not been profitable. Many of them stated that the main reason for doing custom work was to accommodate their neighbors, and in such cases the price was often not high enough to make the work profitable.

Most of the custom work reported was done by men owning large or medium-sized trucks. Only seven of the men who own half-ton trucks reported that they did any custom work, and the average amount received by the seven for the work which they did during the year was \$53.

ANNUAL USE OF TRUCKS.

The number of miles per year which a truck travels has a direct bearing upon the cost per mile run and per ton hauled, and the prospective purchaser should give careful consideration to the amount of use which he will have for the truck. The amount of material to be hauled, the size of the truck, and the length of haul will all have an influence on the distance per year which a truck will travel. Depreciation, interest, and repairs are all more or less independent of the number of miles which the truck travels per year, and the greater the number of miles traveled or the greater the amount of material hauled the less will be the charge per mile run or per ton hauled for these items.

The distances which their owners estimate these trucks travel annually are shown in figure 7. The average distance traveled per year, according to these estimates, is 3,820 miles.

These men also estimated the number of days per year on which they use their trucks—not the number of full day's work which the truck does, but simply the number of days on which some use is made of it. On the average truck farmers use their machines on 160 days during the year, dairy farmers on 244 days, fruit farmers on 159 days, crop farmers on 127 days, and general farmers on 162 days. Thus, the dairy farmers use their trucks on the most days, and the crop farmers on the fewest.

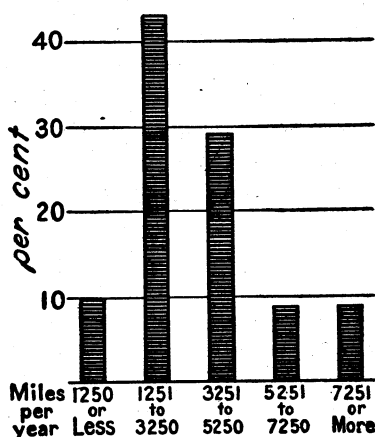


FIG. 7.—Percentage of trucks which travel different distances per year.

COST OF OPERATION.

FIRST COST.

The average first cost of the trucks of different sizes, including extra equipment, was \$600 for the $\frac{1}{2}$ -ton truck, \$1,306 for the $\frac{3}{4}$ -ton, \$959 for the 1-ton, \$1,842 for the $1\frac{1}{4}$ and $1\frac{1}{2}$ ton, and \$2,465 for the 2-ton. Often the quoted price of a truck does not include some equipment which it is necessary or desirable to have, and nearly 75 per cent of these men had purchased some such equipment. This varied from minor attachments costing only \$2 or \$3 to cabs and bodies costing as much as \$200 or \$300. Seven of these men had also purchased trailers for use with their trucks, but the cost of these is not included in the figures above.

It must be remembered that over a third of these trucks were purchased in 1917 or earlier and on that account the average first cost of the different sizes as given above is somewhat lower than the present prices (1921) of trucks of similar quality.

LIFE.

The average life of all these trucks, as estimated by the owners, is 6.7 years. The estimated life of the $\frac{1}{2}$ -ton trucks is 6.6 years, $\frac{3}{4}$ -ton trucks 7.1 years, 1-ton trucks 6.3 years, $1\frac{1}{4}$ and $1\frac{1}{2}$ ton trucks 7.2 years, 2-ton trucks 7.9 years.

The estimate of the life of a truck depends not only upon the probable amount of work which it will do and the care which it will be given, but also upon the owner's idea as to when it will be cheaper to discard it and purchase a new one than to spend more time and money on it for repairs. There is quite a wide variation in the individual estimates on this item, but the averages will give the prospective purchaser a fairly definite idea of the amount of service he may expect from a truck.

DEPRECIATION.

The average first costs of the trucks of different sizes divided by the average life gives an annual depreciation of \$91 for the $\frac{1}{2}$ -ton trucks, \$184 for the $\frac{3}{4}$ -ton trucks, \$152 for the 1-ton trucks, \$256 for the $1\frac{1}{4}$ and $1\frac{1}{2}$ ton trucks, and \$312 for the 2-ton trucks. The annual depreciation divided by the average number of miles traveled per year gives a depreciation charge per mile of travel of 2.4 cents for the $\frac{1}{2}$ -ton trucks, 4.2 cents for the $\frac{3}{4}$ -ton trucks, 4.1 cents for the 1-ton trucks, 8.3 cents for the $1\frac{1}{4}$ and $1\frac{1}{2}$ ton trucks, and 7.7 cents for the 2-ton trucks.

The depreciation per year and per mile will vary greatly for individual trucks, but these average figures at least show the importance of this item. For each size the depreciation charge as here given is greater than the combined costs of fuel and oil, and for the larger sizes it is greater than the combined costs of fuel, oil, and tires.

REPAIRS.

The repair costs vary greatly with individual trucks, but the prospective owner will desire to know something as to what he must expect. Repairs will ordinarily be low for the first year or two of the truck's life. Forty per cent of the men who had owned their trucks 12 months or less had spent nothing for repairs, and for no size had the repairs for machines which had been in use less than a year cost more than \$20 on the average. However, very few men who had owned their trucks for more than a year had been free from expense for repairs.

About 100 men who had owned their trucks more than three years reported the cost of repairs. The average age of these older trucks was not far from four years, and the average *annual* repair costs to date for the $\frac{1}{2}$ -ton trucks had been about \$35; for the $\frac{3}{4}$ -ton trucks, about \$50; for the 1-ton trucks, about \$40; for the $1\frac{1}{4}$ and $1\frac{1}{2}$ ton trucks, about \$35; and for the 2-ton trucks, over \$100.

It is apparent, however, that these figures are too low for the average annual repair cost for the entire life of the machine. Based on present prices, a fair average for the repair costs covering the entire life of the machines would probably be something like \$50 per year for the $\frac{1}{2}$ -ton trucks, \$75 for the $\frac{3}{4}$ -ton trucks, \$75 for the 1-ton trucks, \$100 for the $1\frac{1}{4}$ and $1\frac{1}{2}$ ton trucks, and \$150 for the 2-ton trucks.

GASOLINE AND OIL.

The average number of miles per gallon of gasoline obtained by men who own trucks of different sizes is about 15 miles for the $\frac{1}{2}$ -ton, 12 miles for the $\frac{3}{4}$ -ton, 11 miles for the 1-ton, $9\frac{1}{2}$ miles for the $1\frac{1}{4}$ and $1\frac{1}{2}$ ton trucks, and 8 miles for the 2-ton trucks. The average number of miles per quart of lubricating oil is about 60 for the $\frac{1}{2}$ and $\frac{3}{4}$ ton trucks, about 50 for the 1, $1\frac{1}{4}$, and $1\frac{1}{2}$ ton trucks, and about 40 for the 2-ton trucks.

These men were paying an average of 27 cents per gallon for gasoline and 65 cents per gallon for oil at the time of reporting (January and February, 1920). On this basis the total cost per mile for gasoline and lubricating oil was: For the $\frac{1}{2}$ -ton trucks, 2.1 cents; $\frac{3}{4}$ -ton trucks, 2.5 cents; 1-ton trucks, 2.7 cents; $1\frac{1}{4}$ and $1\frac{1}{2}$ ton trucks, 3.1 cents; and for the 2-ton trucks, 3.8 cents.

TIRES.

According to the estimates of these truck owners, the average cost per mile of tires, after making allowance for the tires with which the trucks were equipped when purchased and not including a charge for inner tubes for pneumatic tires, is 1.6 cents for pneumatic tires on one-half-ton trucks, 2.9 cents for pneumatics on three-fourths-ton trucks, 1.6 cents for pneumatics on 1-ton trucks, 1.3 cents for solid tires on 1-ton trucks, 1.7 cents for solids on the $1\frac{1}{4}$ and $1\frac{1}{2}$ ton, and 2.5 cents for solids on the 2-ton. A large percentage of the 1-ton trucks are equipped with smaller tires than those used on many of the $\frac{3}{4}$ -ton trucks, thus making the average tire cost for the 1-ton size lower than for the $\frac{3}{4}$ -ton truck.

The estimates of 318 men show that pneumatic tires on these trucks run an average of 4,500 miles and the estimates of 206 men show that solid tires run an average of 8,200 miles.

AVERAGE COST PER MILE.

The average cost per mile of operating the trucks of different sizes, including charges for depreciation, repairs, interest on investment, registration and license fees, gasoline, oil, and tires, is 8.2 cents for the $\frac{1}{2}$ -ton trucks, 12.7 cents for the $\frac{3}{4}$ -ton trucks, 11.9 cents for the 1-ton trucks, 19.0 cents for the $1\frac{1}{4}$ and $1\frac{1}{2}$ ton trucks, and 20.3 cents for the 2-ton trucks (see fig. 8).

Interest has been calculated at 6 per cent on the average investment, such average investment being determined by the rule: First

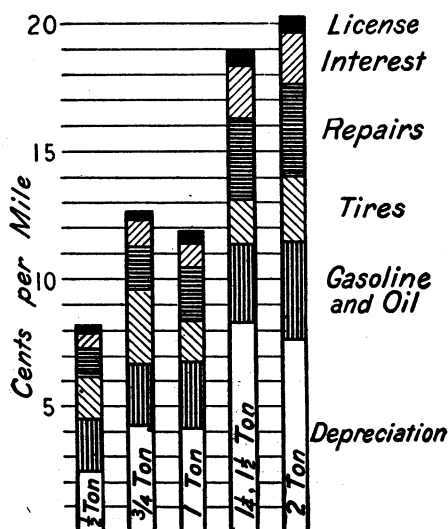


FIG. 8.—Cost per mile of operating trucks of different sizes.

cost multiplied by years of service plus one and this result divided by the years of service multiplied by two. The cost of hauling with a truck is determined by the cost of operating the truck, the charge for the driver's time and labor, the size of load hauled, and the percentage of time which a truck runs without a load. The average time required for hauling, including loading and unloading the truck, as given by these men is 0.14 hour per mile of travel for the $\frac{1}{2}$ and $\frac{3}{4}$ ton trucks and 0.15 hour for the 1-ton and larger. Under present conditions 50 cents per hour is probably a fair rate for the driver's time while actually at work.

These men have return loads for their trucks about 26 per cent of the time; that is, on the average the trucks haul loads both ways on 26 out of every 100 round trips and run without loads on 74 one-way trips. The cost of operating the truck and the value of the driver's time for these 74 trips without loads must be charged against the 126 trips with loads in order to obtain the actual cost per mile of haul.

The average load of crops hauled with the $\frac{1}{2}$ -ton trucks weighs 0.48 ton; with the $\frac{3}{4}$ -ton trucks, 0.93 ton; with the 1-ton trucks, 1.20 tons;

These costs do not include charges for taxes, housing, insurance, labor of the owners in caring for and repairing the trucks, grease, and inner tubes for pneumatic tires. However, these items will ordinarily amount to only a small percentage of the total cost.

COST OF HAULING WITH TRUCKS.

with the $1\frac{1}{2}$ and $1\frac{1}{2}$ ton trucks, 1.73 tons; and with the 2-ton trucks, 2.46 tons.

On this basis 50.2 cents is the average cost per ton-mile of hauling crops with the one-half-ton trucks, 33.8 cents with the $\frac{3}{4}$ -ton trucks, 25.8 cents with the 1-ton trucks, 24.2 cents with the $1\frac{1}{2}$ and $1\frac{1}{2}$ ton trucks, and 17.9 cents with the 2-ton trucks (see fig. 9).

KINDS OF TIRES RECOMMENDED BY USERS.

An important point on which the prospective purchaser of a truck must make a decision is the kind of tires which he will use, and here again the opinions of men who have had experience with trucks are especially valuable.

Thirty-six per cent of these eastern truck owners now use pneumatic tires, 33 per cent use solids, and 31 per cent pneumatics in front and solids in rear. However, experience has convinced 50 per cent that pneumatics are best for their conditions, 41 per cent that solids are best, and 9 per cent that pneumatics in front and solids in rear are best.

The kind which a man considers best depends considerably upon the size of his truck. Eighty-five per cent of the owners of one-half and three-fourths ton trucks think that pneumatic tires are best. The owners of 1-ton trucks are about evenly divided in their preference, and over 80 per cent of the owners of trucks larger than 1 ton think that solids are best.

The choice of tires for any particular truck will, of course, depend not only upon the size of the truck but also upon the character of materials to be hauled with it, the amount of hauling to be done, and the kinds of roads on which it is to be used.

RELIABILITY.

The reliability of a motor truck, as that of any other farm machine, has a very decided effect upon its profitableness. If a truck is out of order at a time when its services are needed through a busy time, it can scarcely be considered a profitable machine. Likewise, if a great deal of time is lost on the road on account of motor and tire trouble, breakage, or other delays all the advantages attending its use may be overcome. In order to obtain information as to the reliability

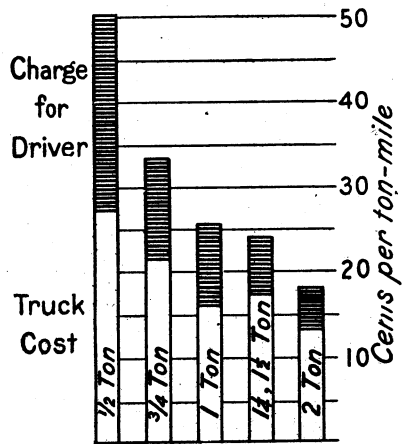


FIG. 9.—Cost per ton-mile of hauling crops with trucks of different sizes.

of motor trucks for farm use these truck owners were asked to give both the number of days their trucks had been out of running order when needed during the past year, and the percentage of lost time during use.

Seventy-one per cent of the trucks had not been out of order at all when needed, 20 per cent had been out of order five days or less, 6 per cent had been out of order from 6 to 10 days, and 3 per cent had been out of order over 10 days. In general the newer trucks are more reliable than the older ones. While only about 15 per cent of the trucks which had been owned 12 months or less had been out of order for a day or more when needed, nearly one-half of those which had been in use more than three years had been out of order at some time during the preceding year.

Similarly, the newer trucks are more reliable in respect to the amount of time lost on account of motor and tire trouble.

Eighty per cent of the men whose trucks had been in use 12 months or less stated that they had lost no appreciable time, but only one-half of those whose trucks had been in use more than three years stated they had lost no time. In all, 67 per cent of the total stated that they had lost no time, and only one man in 26 stated that more than 5 per cent of the time was lost on this account.

The average distance crops are hauled by these men is about 10 miles, and the average time required for the round trip is not far from three hours. A loss of 5 per cent of the time on such a trip would mean a delay of about 10 minutes, and a loss of 10 per cent of the time would be a delay of about 20 minutes. Such delays, even with the trucks which give the most trouble in this respect, would scarcely be as serious as the loss due to having the truck out of running order several days when it was needed.

To a certain extent the reliability of a motor truck depends upon the ability of the operator and the care which the truck is given. Roughly, about 60 per cent of these trucks are operated by their owners, about 30 per cent by the sons of the owners, and about 10 per cent by hired men. Automobiles are owned on about three-fourths of these farms, and tractors on about one-fourth of them. It is to be expected that the owner of such an expensive machine as a motor truck, or any member of his family, would give it a reasonable amount of care and operate it with a reasonable degree of intelligence, and the fact that automobiles or tractors were owned on a large percentage of these farms indicates that most of the operators were more or less skilled in the operation of gas engines. That such a large percentage of these trucks were operated without any loss of time, being always ready for work when needed, is very probably due in part to these facts. At least it is apparent that the man who has

learned to operate an automobile or a tractor efficiently need expect little trouble from a motor truck.

SAVING OF HIRED HELP.

The saving of time is given by these men as the greatest advantage in the use of a motor truck, but the saving will not be of any financial benefit to a farmer unless he uses the time thus saved or unless it enables him to reduce the amount of hired help.

These men were asked whether or not their trucks reduce the expense for hired help, either man or horse; and if so, to estimate the amount thus saved per year. Of 711 men who answered the question 562, or 79 per cent, said that the truck did reduce the expense of this item, and the remaining 149 said that it did not.

Three hundred and fifty of the 562 estimated the amount thus saved, and the average of these estimates is \$324. This figure can scarcely be taken to represent the actual amount which their labor bills have been reduced since purchasing their trucks, but rather as an average of the estimates as to the amounts by which their bills would be increased at going rates for labor if they did not now own trucks, and if they were doing the same amount of work they are now doing.

Eighty-four per cent of the operators of fruit farms think that their trucks reduce the expense for hired help. This is a slightly higher percentage than is reported for any other type of farming. The average of the estimates of those of this 84 per cent who attempted to place a value on the amount of help saved is \$364.

The owners of the larger trucks make higher estimates of the amount that their trucks reduce expenses than do those who own the smaller ones. The averages of the estimates of the owners of the $\frac{1}{2}$, $\frac{3}{4}$, and 1 ton trucks who report that their trucks reduce the bill for hired help were between \$250 and \$300, the average of the estimates of the owners of the $1\frac{1}{4}$ and $1\frac{1}{2}$ ton trucks was between \$375 and \$400, and the estimates of the owners of the 2-ton trucks and of those over 2 tons averaged more than \$600. There is no great difference in the percentages of the owners of the different sizes who consider that their trucks do not reduce the expense for hired help.

DISPLACEMENT OF HORSES.

The operators of 610 farms reported the number of head of work stock they owned before purchasing their trucks and the number they had disposed of since that time. Four of these 610 were small farms, which had been operated without horses even before trucks were purchased. The number of head of work stock kept on the

other 606 farms varied from 1 or 2 on the smaller farms to 20 and more on a few of the larger ones. The total number kept on the 606 farms was 3,103. On over one-half of the 606 farms no change had been made in the number of head of work stock kept since purchasing the trucks. On 296 of them the number had been reduced, since the trucks were purchased, by a total of 586 head, an average reduction of 19 per cent and an average displacement of a little less than one head per truck purchased. (See fig. 10.)

A man with only one or two horses will usually need to keep them for work on the farm even after buying a truck, and only about one man in seven who owned one or two horses had sold any since buying his truck. Similarly, the purchase of a motor truck will not ordinarily

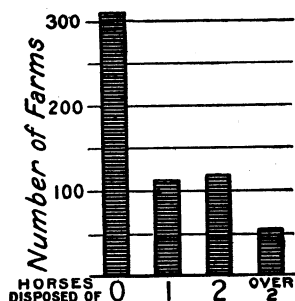


FIG. 10.—Number of head of work stock disposed of on 606 farms after purchase of trucks.

enable a man who owns three or four horses, all of which he sometimes uses as a single unit, to reduce the number of his work stock. A little less than one-half of the men who had owned three or four horses before purchasing their trucks reported that they had disposed of any since that time, but nearly two-thirds of those who had owned five or more had disposed of at least one after purchasing the truck.

As only 55 of the 606 men disposed of more than two head of work stock, it appears that only rarely will the purchaser of a truck be able to dispose of enough horses to pay for it. Although the use of motor trucks on the larger farms makes it possible to dispose of some of the work stock, it is apparent that on the smaller farms the truck more frequently supplements rather than supplants the horse.

This displacement of horses by motor trucks is quite comparable to the displacement by tractors in this section. A study of 252 New York farms on which tractors are owned, as reported in *Farmers' Bulletin 1004*, "The Gas Tractor in Eastern Farming," showed that on these farms the total work stock owned when the tractors were purchased amounted to 1,321, while the total after the purchase of tractors was 1,018, a reduction of 22 per cent and an average displacement of 1.2 head per tractor.

WORK STOCK ON FARMS WHERE BOTH TRUCKS AND TRACTORS ARE OWNED.

Over two-thirds of these farms, where trucks are owned, consist of not over 120 crop acres. Tractors are owned on only about 15 per cent of such farms, while they are owned on 55 per cent of those

with more than 120 crop acres. In most cases the reports did not show the size of the tractor owned, but at least a part of the tractors owned on the small farms are of only one or two draw-bar horsepower, and are capable of doing the work of only about one horse.

The ownership of both motor trucks and tractors, even on the large farms, has not resulted in a very great reduction in the number of horses. Forty-seven men, who own both trucks and tractors, and who have from 61 to 120 crop acres, keep on the average nearly four horses—one horse for each 24 crop acres—and only six of them are farming with fewer than three horses; 42 men who have from 121 to 180 crop acres keep an average of five horses—one for each 30 acres—and only six of them are now farming with fewer than four horses. Seventy men, who have over 180 crop acres, keep an average of between eight and nine horses—one for each 39 crop acres—and only three of them are farming with fewer than four horses.

The number of crop acres per horse on the farms of different sizes, where trucks, but not tractors, are owned, is only about two acres less in each case than on the farm where tractors are owned, there being 22 crop acres per horse on the farms with 61 to 120 crop acres where tractors are not owned, 28 per horse on those with 121 to 180 crop acres, and 37 per horse on those with over 180 crop acres.

